NASA SBIR/STTR Technologies

Closed Loop Waste Processing Dryer (DRYER)
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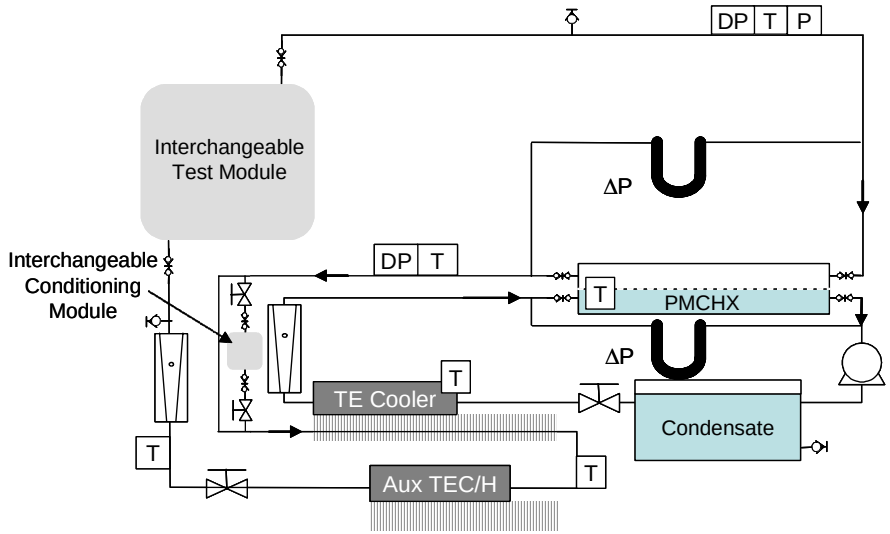
Proposal No. 03-T5.01-9899

Identification and Significance of Innovation

- **Closed loop drying prevents release of VOC's into the cabin atmosphere and puts no extra load on the cabin condensate recovery system**
- **The system is energy-efficient due to enthalpy recovery in the heat pump loop**
- **The only moving parts are the water pump, blower, and valves when they activate**
- **Micro-organisms are deactivated at the start of drying**
- **Little crew labor is required for handling, as the trash is dried directly in the heat-resistant collection bag and may be compacted afterwards.**



Technical Objectives

- **Design and Fabricate Dryer Testbed**
- **Characterize Performance of PMCHX**
- **Perform Preliminary Application Tests**
  - **Waste**
  - **Laundry**
  - **Brine**
- **Evaluate Products of Trash Drying**
- **Evaluate Biofilm Formation and Control**
- **Conduct Preliminary ESM Analysis**

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NASA Applications

- **Dry ALS wet cabin waste to recover water and reduce waste volume**
- **Dry crew laundry**
- **Recover water from water reprocessing brines**
- **Dry salad machine wastes such as lettuce roots, carrot tops, vegetable**
- **Trim waste and used nutrient delivery wicks**
- **Use in a planetary colony for drying food products such as grains or beans**
- **Improve the efficiency of present-day space PMCHX applications**
- **Provide an alternative to the condenser-slurper-vortex separator technology**

Non-NASA Applications

If the PMCHX heat transfer characteristics prove superior to conventional condensers, PMCHXs could be adopted for terrestrial HPD drying applications